REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 23-30 are pending in this application. Claims 23-30 are added; and Claims 1-5, 11-15, 21 and 22 are canceled without prejudice or disclaimer by the present amendment. Support for new Claims 23-30 can be found in the original specification, claims and drawings. No new matter is added.

In the Office Action, Claims 1-4 and 11-14 were rejected under 35 U.S.C. 103(a) as unpatentable over Strobel (U.S. Pat. 6,650,724) in view of Mullick et al. (U.S. Pat. 7,123,760, herein Mullick); Claims 5 and 15 were rejected under 35 U.S.C. 103(a) as unpatentable over Strobel in view of Mullick and Buzug et al. (U.S. Pat. 5,956,435, herein Buzug); and Claims 21 and 22 were rejected under 35 U.S.C. 103(a) as unpatentable over Strobel in view of Mullick and Klotz et al. (U.S. Pat. 6,845,142, herein Klotz).

In response to the above noted rejections, Claims 1-5, 11-15, 21 and 22 are canceled by the present amendment thereby rendering the rejections moot. Applicant, however, respectfully submits that new independent Claims 23-26 recite novel features clearly not taught or rendered obvious by the applied references.

New Claim 23, for example, recites, in part, an image processing apparatus comprising:

> ...an input device configured to be used by an operator to select one of three modes of 3D image processing on the object, the apparatus configured to operate according to this selection, such that in the first mode:
> mask and contrast images are input and subtracted by the subtraction unit to generate digital subtraction images which are separately processed by the reconstruction unit to generate 3D digital mask and subtraction images, which are then separately processed by the image processing unit to generate surface rendered digital mask and subtraction images, which are then synthesized by the image synthesizing unit into a combined 3D digital image which is displayed on the display unit;

in the second mode:

mask and contrast images are input and separately processed by the reconstruction unit to generate 3D digital mask and contrast images which are then subtracted by the subtraction unit to generate 3D digital subtraction images, the 3D digital mask and subtraction images then being separately processed by the image processing unit to generate surface rendered digital mask and subtraction images, which are then synthesized by the image synthesizing unit into a combined 3D digital image which is displayed on the display unit;

and in the third mode:

mask and contrast images are subtracted in the subtraction unit to generate digital subtraction images viewed from the plurality of projection directions, then the digital subtraction images and the digital contrast images are separately processed by the reconstruction unit to generate 3D digital contrast and subtraction images, which are then subtracted from each other in the subtraction unit to generate 3D digital mask images, the 3D digital mask and subtraction images then being separately processed by the reconstruction unit to generate 3D digital mask and subtraction images, which are then separately processed by the image processing unit to generate surface rendered digital mask and subtraction images, which are then synthesized by the image synthesizing unit into a combined 3D digital image which is displayed on the display unit.

Independent Claims 24-26, while directed to alternative embodiments, recite at least a subset of the features noted above. Accordingly, the remarks and arguments presented below are applicable to each of independent Claims 23-26.

In rejecting the previously pending claims, the Office Action admitted that Strobel fails to teach or suggest "a second subtracting unit configured to generate mask volume data by subtracting second volume data containing vessels, from first volume data containing both bone structures and enhanced vessels..." In an attempt to remedy this deficiency, the Office Action relies on Mullick and states that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the cited references to arrive at Applicant's claims. Applicant respectfully submits that the applied references, neither alone, nor in combination, teach or suggest the above noted features directed to the "three modes of 3D image processing" as recited in new independent Claim 23.

Mullick describes a technique for automatically identifying regions of bone or other structural regions within a reconstructed CT volume data set.[1] The technique identifies and labels regions within the data set and computes various statistics for the regions, and a rule-based classifier processes the statistics to classify each region. A structure mask, such as a bone mask, is then constructed after exclusion of regions of interest, and may be used to construct a volume rendering free of the structure, such as bone-free.

In rejecting the previously pending claims, the Office Action relied on col. 13, ll. 54-58 and col. 12, ll. 63-67 of Mullick in asserting that "varying the translucence of particular structures to enable exclusion of particular structures in the image... is equivalent to subtracting second volume data (i.e. volume data containing vessels) from first volume data (i.e. volume data containing both bone structures and vessels) because specific image data within the volume rendered contrast data is subtracted..." More concretely, col. 13, lines 54-58 of Mullick describes that a bone mask may be shown in varying degrees of opacity and translucence, and that an operator may use the presence of a mask structure to provide orientation and location information. Once oriented, the mask may be excluded to examine the structures of interest, and in addition to configuring the translucence or opacity of the mask, the operation may be provided with the ability to increase or decrease intensity to generate the desired rendering.

In contrast the first mode of image processing, as recited in Claim 23, recites that "mask and contrast images are input and *subtracted by the subtraction unit to generate digital subtraction images which are separately processed by the reconstruction unit to generate 3D digital mask and subtraction images*, which are then *separately processed by the image processing unit to generate surface rendered digital mask and subtraction*

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[1] Mullick, Abstract.

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images, which are then synthesized by the image synthesizing unit into a combined 3D

digital image which is displayed on the display unit."

Mullick, on the other hand, merely describes that a bone mask may be shown in

varying degrees of opacity and translucence, and that an operator may use the presence of a

mask structure to provide orientation and location information. Once oriented, the mask may

be excluded to examine the structures of interest, and in addition to configuring the

translucence or opacity of the mask, the operation may be provided with the ability to

increase or decrease intensity to generate the desired rendering. Thus, Mullick merely

describes that an operator may increase or decrease the visual intensity of the mask data, for

example, to more easily orientate or view the contrast data, thus indicating that one of the

mask or contrast data may be subtracted from a combination of the mask and contrast data.

Mullick, however, fails to teach or suggest that "mask and contrast images are input

and *subtracted by the subtraction unit to generate digital subtraction images which are*

separately processed by the reconstruction unit to generate 3D digital mask and subtraction

images, which are then *separately processed by the image processing unit to generate*

surface rendered digital mask and subtraction images, which are then synthesized by the

image synthesizing unit into a combined 3D digital image which is displayed on the display
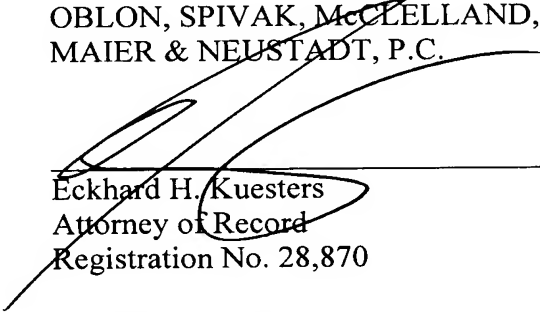
unit," as recited in independent Claim 23.

Therefore, Applicant respectfully submits that Strobel and Mullick, neither alone, nor

in combination, teach or suggest the features recited in independent Claim 23. For

substantially similar reasons it is also submitted that new independent Claims 24-26 also

patentably define over Strobel and Mullick.

Further, the Buzug and Klotz references, relied upon by the outstanding Office Action

to form a 35 U.S.C. §103(a) rejection of the dependent claims, does also not remedy the

deficiencies of Strobel and Mullick.

Consequently, in view of the present amendment and in light of the foregoing comments, it is respectfully submitted that the invention defined by Claims 23-30 patentably define over the applied references. The present application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of the application is therefore requested.

Respectfully submitted,

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